A' cont.

Rule 126

(ii)   at least one pan DR binding peptide selected from the formula R_1-R_2-R_3-R_4-R_5, wherein:

R_1 is an amino acid followed by alanine or lysine;

R_2 is selected from the group consisting of tyrosine, or phenylalanine;

R_3 is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

R_4 is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

R_5 consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine.

79. *(19)* The polynucleotide of claim 78, wherein the polynucleotide is comprised by an expression vector.

80. *(20)* The polynucleotide of claim 78, wherein the fusion protein comprises multiple pan DR peptides.

81. *(21)* The polynucleotide of claim 78, wherein the fusion protein comprises a homopolymer of pan DR peptides.

82. *(22)* The polynucleotide of claim 78, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

83. *(23)* The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises a heteropolymer with repeating units.

84. *(24)* The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

85. *(25)* The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

Rule 126

A' cont.

26

86. The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

27
87. A method of synthesizing a fusion protein comprising at least one pan DR peptide and an immunogenic peptide, native protein fragment or particle, the method comprising,

 (a) selecting a vector comprising a polynucleotide encoding a fusion protein, the fusion protein comprising,

  (i) an immunogenic peptide, a native protein fragment or a particle, and,

  (ii) at least one pan DR binding peptide selected from the formula R_1-R_2-R_3-R_4-R_5, wherein:

  R_1 is an amino acid followed by alanine or lysine;

  R_2 is selected from the group consisting of tyrosine, or phenylalanine;

  R_3 is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

  R_4 is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

  R_5 consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine;

 (b) transforming a host cell with the vector; and,

 (c) expressing the fusion protein in the host cell.

28
88. The method of claim 86, wherein the fusion protein comprises multiple pan DR peptides.

29
89. The method of claim 87, wherein the fusion protein comprises a homopolymer of pan DR peptides.

30
90. The method of claim 87, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

A' cont.

Rule 126

31.
91. The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises a heteropolymer with repeating units.

32.
92. The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

33.
93. The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

34.
94. The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

A' cont.

95. A fusion protein comprising,

(i)   an immunogenic peptide, a native protein fragment or a particle, and,

(ii)   at least one pan DR binding peptide selected from the formula R_1-R_2-R_3-R_4-R_5, wherein:

R_1 is an amino acid followed by alanine or lysine;

R_2 is selected from the group consisting of tyrosine, or phenylalanine;

R_3 is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

R_4 is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

R_5 consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine.

96. The fusion protein of claim 95, wherein the fusion protein comprises multiple pan DR peptides.

97. The fusion protein of claim 95, wherein the fusion protein comprises a homopolymer of pan DR peptides.

98. The fusion protein of claim 95, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

99. The fusion protein of claim 95, wherein the immunogenic peptide, native protein fragment or particle comprises a heteropolymer with repeating units.

100. The fusion protein of claim 95, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

101. The fusion protein of claim 95, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

102. The fusion protein of claim 95, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

A' cont.

Rule 126

43
~~103.~~ A method of inducing an immune response in a human, the method comprising introducing of a composition of claim 78 into a human.

44
~~104.~~ The method of claim 103, wherein the polynucleotide is comprised by an expression vector.

45
~~105.~~ The method of claim 103, wherein the fusion protein comprises multiple pan DR peptides.

46
~~106.~~ The method of claim 103, wherein the fusion protein comprises a homopolymer of pan DR peptides.

47
~~107.~~ The method of claim 103, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

48
~~108.~~ The method of claim 103, wherein the immunogenic peptide, native protein fragment or particle comprises a heteropolymer with repeating units.

49
~~109.~~ The method of claim 103, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

50
~~110.~~ The method of claim 103, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

51
~~111.~~ The method of claim 103, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

A¹ cont.

Rule 126

52
112.   A method of inducing an immune response in a human, the method comprising introducing of a composition of claim 95 into a human.

53
113.   The method of claim 112, wherein the fusion protein comprises multiple pan DR peptides.

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114.   The method of claim 112, wherein the fusion protein comprises a homopolymer of pan DR peptides.

55
115.   The method of claim 112, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

56
116.   The method of claim 112, wherein the native protein fragment or particle comprises a heteropolymer with repeating units.

57
117.   The method of claim 112, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

58
118.   The method of claim 112, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

59
119.   The method of claim 112, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

A' cont.

Rule 126

61

~~120.~~ A composition for eliciting an immune response to a T-cell and/or antibody-inducing peptide, the composition comprising multiple pan DR peptides linked to one or more T-cell and/or antibody-inducing peptide,

wherein the pan DR binding peptides are selected from the formula R_1-R_2-R_3-R_4-R_5, wherein:

R_1 is an amino acid followed by alanine or lysine;

R_2 is selected from the group consisting of tyrosine or phenylalanine;

R_3 is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

R_4 is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

R_5 consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine.

~~121.~~ The composition of claim 120, wherein the composition comprises multiple pan DR peptides.

~~122.~~ The composition of claim 120, wherein the composition comprises a homopolymer of pan DR peptides.

~~123.~~ The composition of claim 120, wherein the composition comprises a heteropolymer of pan DR peptides.

~~124.~~ The composition of claim 120, wherein the T-cell and/or antibody-inducing peptide comprises a heteropolymer with repeating units.

~~125.~~ The composition of claim 120, wherein the T-cell and/or antibody-inducing peptide comprises a T helper peptide.